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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/920,286	08/02/2001	Xiaobin Zhao	0623.1110001/JMC/MGP	3882
26191	7590	02/23/2005	EXAMINER	
FISH & RICHARDSON P.C. 3300 DAIN RAUSCHER PLAZA 60 SOUTH SIXTH STREET MINNEAPOLIS, MN 55402			LEWIS, PATRICK T	
			ART UNIT	PAPER NUMBER
			1623	

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/920,286

Applicant(s)

ZHAO, XIAOBIN

Examiner

Patrick T. Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-9,11-15,18-21,24-26,29 and 36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,9,12-15,18-21,24-26,29 and 36 is/are rejected.
- 7) ☒ Claim(s) 5-8 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12132004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Applicant's Response Dated December 13, 2004

1. In the Response filed December 13, 2004, claims 1, 7, 13-14 and 24 were amended; claims 3, 10, 16-17, 22-23, 27-28 and 30-35 were canceled; and claim 36 was added. Claims 1, 2, 4-9, 11-15, 18-21, 24-26, 29 and 36 are pending. An action on the merits of claims 1, 2, 4-9, 11-15, 18-21, 24-26, 29 and 36 is contained herein below.
2. The objection to the specification for not containing Brief Description of Drawings is maintained for the reasons of record as set forth in the Office Action dated August 10, 2004.
3. The rejection of claims 27-28 and 33-34 under 35 U.S.C. 112, first paragraph, has been rendered moot in view of the amendment dated December 13, 2004.
4. The rejection of claims 1-2, 4, 12-13, 15, 18 and 20-21 under 35 U.S.C. 102(b) as being anticipated by Tomihata et al. *Journal of Biomedical Materials Research* (1997), Vol. 37, pages 243-251 (Tomihata) is maintained for the reasons of record as set forth in the Office Action dated August 10, 2004.
5. The rejection of claims 3 and 16-17 under 35 U.S.C. 102(b) as being anticipated by Tomihata et al. *Journal of Biomedical Materials Research* (1997), Vol. 37, pages 243-251 (Tomihata) has been rendered moot in view of the amendment dated December 13, 2004.
6. The rejection of claims 1-2, 4, 9, 12-15, 18-21, 24-26, and 29 under 35 U.S.C. 103(a) as being unpatentable over Tomihata et al. *Journal of Biomedical Materials*

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Research (1997), Vol. 37, pages 243-251 (Tomihata) and Nguyen US 5,690,961 (Nguyen) in combination is maintained for the reason of record as set forth in the Office Action dated August 10, 2004.

7. The rejection of claims 3, 16-17, 27-28 and 30-35 under 35 U.S.C. 103(a) as being unpatentable over Tomihata et al. *Journal of Biomedical Materials Research* (1997), Vol. 37, pages 243-251 (Tomihata) and Nguyen US 5,690,961 (Nguyen) has been rendered moot in view of the amendment dated December 13, 2004.

8. The objection to claims 5-8 and 11 is maintained for the reasons of record as set forth in the Office Action dated August 10, 2004.

Rejections/Objections of Record Set Forth in the Office Action

Dated August 10, 2004

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. The disclosure is objected to because of the following informalities: the disclosure does not contain Brief Description of the Drawings.

Applicant has indicated that the specification has been amended to incorporate the Brief Description of the Drawings; however, upon the examiner's review of the amendment dated December 13, 2004, no such amendment was found. The objection is therefore maintained.

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11. Claims 1-2, 4, 12-13, 15, 18 and 20-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Tomihata et al. *Journal of Biomedical Materials Research* (1997), Vol. 37, pages 243-251 (Tomihata).

Applicant's arguments filed December 13, 2004 have been fully considered but they are not persuasive. Applicant argues that the procedures disclosed by Tomihata do not result in HA molecules cross-linked to one another by two or more types of bonds. In support of applicant's position, a declaration 37 CFR 1.132 by Xiaobin Zhao was presented.

The declaration under 37 CFR 1.132 filed December 13, 2004 is insufficient to overcome the rejection of claims 1-2, 4, 12-13, 15, 18 and 20-21 based upon 35 U.S.C. 102(b) as being anticipated by Tomihata as set forth in the last Office action because: applicant has failed to set forth sufficient evidence to rebut the prima facie case.

Mr. Zhao stated that based on the teachings of US 6,096,727 and WO 00/54762 it was his belief that reacting hyaluronic acid with carbodiimide will result in an acylurea bond, not an ester bond as disclosed by Tomihata. US 6,096,727 teaches the formation of a stable cross-linked HA acylurea by the reaction of HA with a carbodiimide in the absence of a primary amine as nucleophile or a polyanionic polysaccharide (other than HA). The '727 patent teaches that the completeness of the reaction, the nature of the products and the extent of chemical modification can be determined by proton NMR (column 10, lines 5-8); however no NMR spectral data is presented. The reaction conditions of the '727 patent and Tomihata are very different as Tomihata teaches the crosslinking of HA in the presence of a WSC and L-lysine or the methyl ester (pages

247-248). Applicant's attention is further directed to Reactions 1-4 on pages 243 and 249 wherein Tomihata discloses the reaction scheme for crosslinking HA with a water-soluble carbodiimide (WSC) to form ester bonds. Tomihata discloses that the most prominent difference in the IR spectrum between the non-cross-linked and the cross-linked HA film is noticeable at a wavenumber of 1700 cm⁻¹, which is assigned to the carbonyl group most likely of ester bond (page 246). Applicant's arguments and the references cited have been considered; however, based upon the preponderance of the evidence, the rejection is maintained.

12. Claims 1-2, 4, 9, 12-15, 18-21, 24-26, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomihata et al. *Journal of Biomedical Materials Research* (1997), Vol. 37, pages 243-251 (Tomihata) and Nguyen US 5,690,961 (Nguyen) in combination.

Applicant's arguments filed December 13, 2004 have been fully considered but they are not persuasive. Applicant argues that the cited prior art does not result in HA molecules cross-linked to one another by two or more types of bonds. In support of applicant's position, a declaration 37 CFR 1.132 by Xiaobin Zhao was presented.

The declaration under 37 CFR 1.132 filed December 13, 2004 is insufficient to overcome the rejection of claims 1-2, 4, 9, 12-15, 18-21, 24-26, and 29 based upon 35 U.S.C. 103(a) as being unpatentable over the combination of Tomihata and Nguyen as set forth in the last Office action because: applicant has failed to set forth sufficient evidence to rebut the prima facie case.

Mr. Zhao stated that based on the teachings of US 6,096,727 and WO 00/54762 it was his belief that reacting hyaluronic acid with carbodiimide will result in an acylurea bond, not an ester bond as disclosed by Tomihata. US 6,096,727 teaches the formation of a stable cross-linked HA acylurea by the reaction of HA with a carbodiimide in the absence of a primary amine as nucleophile or a polyanionic polysaccharide (other than HA). The '727 patent teaches that the completeness of the reaction, the nature of the products and the extent of chemical modification can be determined by proton NMR (column 10, lines 5-8); however no NMR spectral data is presented. The reaction conditions of the '727 patent and Tomihata are very different as Tomihata teaches the crosslinking of HA in the presence of a WSC and L-lysine or the methyl ester (pages 247-248). Applicant's attention is further directed to Reactions 1-4 on pages 243 and 249 wherein Tomihata discloses the reaction scheme for crosslinking HA with a water-soluble carbodiimide (WSC) to form ester bonds. Tomihata discloses that the most prominent difference in the IR spectrum between the non-cross-linked and the cross-linked HA film is noticeable at a wavenumber of 1700 cm^{-1} , which is assigned to the carbonyl group most likely of ester bond (page 246). Applicant's arguments and the references cited have been considered; however, based upon the preponderance of the evidence, the rejection is maintained.

13. Claims 5-8 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15. Claim 36 is rejected under 35 U.S.C. 102(b) as being anticipated by Tomihata et al. *Journal of Biomedical Materials Research* (1997), Vol. 37, pages 243-251 (Tomihata).

Tomihata discloses a cross-linked HA film containing amide and ester bonds (pages 247-248). L-Lysine methyl ester (crosslinking agent 1) was added to an 80 vol % ethanol / 20 vol % water mixture and the crosslinking of HA was allowed to proceed in the medium in the presence of 10 mM water-soluble carbodiimide (crosslinking agent 2).

Conclusion

16. Claims 1, 2, 4-9, 11-15, 18-21, 24-26, 29 and 36 are pending. Claims 1-2, 4, 9, 12-15, 18-21, 24-26, 29 and 36 are rejected. Claims 5-8 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. No claims are allowed.

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed; and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Contacts

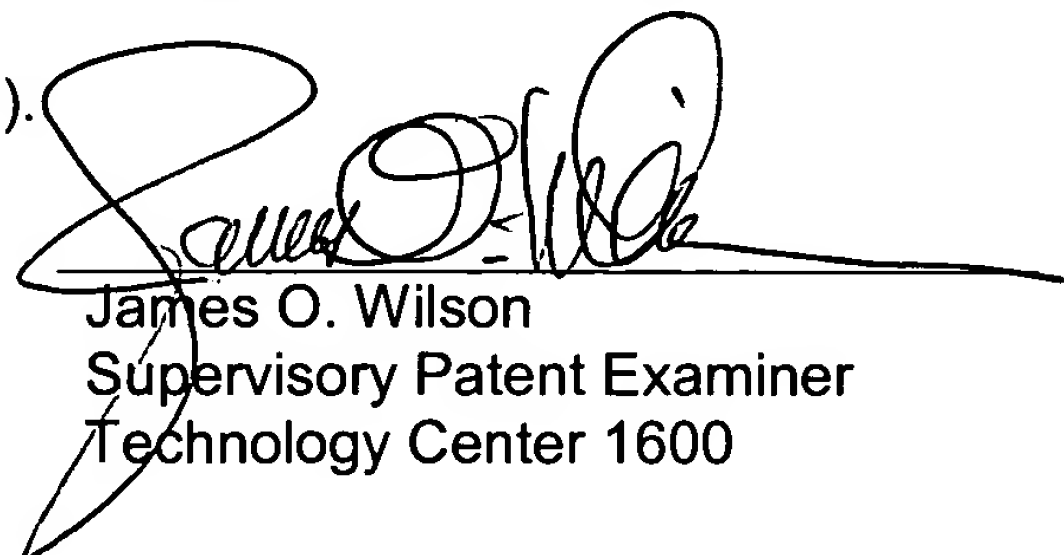
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick T. Lewis whose telephone number is 571-272-0655. The examiner can normally be reached on Monday - Friday 10 am to 3 pm (Maxi Flex).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on 571-272-0661. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick T. Lewis, PhD
Examiner
Art Unit 1623

ptl



James O. Wilson
Supervisory Patent Examiner
Technology Center 1600